

## **AMENDMENTS TO THE CLAIMS**

The following listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (Original) A system for estimating a self posture of a leg type moving robot controlled to follow a determined desired gait, comprising:

- a posture angular velocity detecting means for detecting or estimating an actual posture angular velocity of a predetermined part of the robot;
- an accelerometer mounted on the robot;
- a motional acceleration estimating means for determining an estimated motional acceleration as an estimated value of an acceleration of the accelerometer itself that is generated by a motion of the robot by using a motional state amount of the robot that includes at least one of a desired motion of the desired gait, a detected displacement value of a joint of the robot, and a desired displacement value of the joint; and
- a posture estimating means for estimating an actual posture of the predetermined part on the basis of at least a detected acceleration value by the accelerometer, the estimated motional acceleration, and the detected or estimated actual posture angular velocity.

2. (Original) A system for estimating a self posture of a leg type moving robot controlled to follow a determined desired gait, comprising:

- an accelerometer mounted on the robot;

a posture angular velocity detecting means for detecting or estimating an actual posture angular velocity of a predetermined part of the robot;

a posture estimating means for determining an estimated posture angle value as an estimated value of an actual posture of the predetermined part on the basis of at least the detected or estimated actual posture angular velocity;

a posture rotational error calculating means for determining a temporal variation of a posture rotational error as a posture rotational error variation, the posture rotational error variation indicating a difference between the estimated posture angle value and a desired posture angle of the predetermined part in the desired gait;

a rotational center determining means for determining a rotational center of a change in the posture rotational error; and

a motional acceleration estimating means for determining an estimated motional acceleration as an estimated value of an acceleration of the accelerometer itself generated by a motion of the robot, assuming that the robot rotates about the rotational center with the posture rotational error variation,

wherein the posture estimating means determines the estimated posture angle value while correcting it on the basis of at least a detected acceleration value by the accelerometer and the estimated motional acceleration.

3. (Original) The system for estimating a self posture of a leg type moving robot according to Claim 2, wherein the motional acceleration estimating means comprises a means for determining a second coordinate system formed by rotating a first coordinate system, which is a coordinate system describing the desired gait, about the rotational center by the posture rotational error variation, and the estimated motional acceleration is determined such that an acceleration of the accelerometer itself observed from the first coordinate system that is determined

from at least one of a desired motion of the desired gait, a detected displacement value of a joint of the robot, and a desired displacement value of the joint, and an acceleration of the accelerometer itself when the accelerometer moving at the estimated motional acceleration is observed from the second coordinate system are the same.

4. (Currently Amended) The system for estimating a self posture of a leg type moving robot according to ~~any one of Claims 1 to 3~~Claim 1, wherein the posture estimating means comprises:

an integrating means for determining an estimated posture angle value as an estimated value of an actual posture of the predetermined part by integrating an input that includes at least a detected value of the posture angular velocity;

a posture angle error estimating means for estimating an error of the estimated posture angle value on the basis of a difference between a detected acceleration value by the accelerometer and the estimated motional acceleration; and

an input correcting means for correcting an input of the integrating means so as to bring the estimated error close to zero.

5. (Currently Amended) The system for estimating a self posture of a leg type moving robot according to Claim 1 ~~or 2~~, wherein the predetermined part is a body of the robot.

6. (Original) The system for estimating a self posture of a leg type moving robot according to Claim 2, wherein the estimated posture angle value corrected by the posture estimating means is an estimated value of an inclination angle of the predetermined part relative to a vertical direction.

7. (New) The system for estimating a self posture of a leg type moving robot according to Claim 2, wherein the posture estimating means comprises:

an integrating means for determining an estimated posture angle value as an estimated value of an actual posture of the predetermined part by integrating an input that includes at least a detected value of the posture angular velocity;

a posture angle error estimating means for estimating an error of the estimated posture angle value on the basis of a difference between a detected acceleration value by the accelerometer and the estimated motional acceleration; and

an input correcting means for correcting an input of the integrating means so as to bring the estimated error close to zero.

8. (New) The system for estimating a self posture of a leg type moving robot according to Claim 3, wherein the posture estimating means comprises:

an integrating means for determining an estimated posture angle value as an estimated value of an actual posture of the predetermined part by integrating an input that includes at least a detected value of the posture angular velocity;

a posture angle error estimating means for estimating an error of the estimated posture angle value on the basis of a difference between a detected acceleration value by the accelerometer and the estimated motional acceleration; and

an input correcting means for correcting an input of the integrating means so as to bring the estimated error close to zero.

9. (Currently Amended) The system for estimating a self posture of a leg type moving robot according to Claim 2, wherein the predetermined part is a body of

the robot.